WHAT IS CLAIMED IS:

1. A method for producing pluripotent (ES) cells that can be used to produce differentiated cells and tissues comprising:

(a) obtaining a haploid cell in metaphase II that comprises DNA derived from a single individual male or female, which optionally may be genetically modified;

(b) activating said haploid cell by a method selected from the group consisting of (1) conditions that do not result in second polar body extrusion; (2) conditions that provide for polar body extrusion but in the presence of an agent that inhibits polar body extrusion, and (3) conditions that prevent the initial cleavage, and culturing said activated cell to produce a gynogenetic or androgenetic embryo comprising a discernible trophectoderm and an inner cell mass;

(c) isolating said inner cell mass or cells therefrom and transferring said inner cell mass or cells to an *in vitro* media that inhibits differentiation of said inner cell mass derived therefrom; and

(d) culturing said inner cell mass cells or cells derived therefrom to maintain said cells in an undifferentiated pluripotent state.

2. The method of Claim 1, wherein the metaphase II cell is an oocyte or blastomere.

3. The method of Claim 2, wherein the haploid cell is a human, non-human primate, bovine, porcine, or ovine oocyte or blastomere.

4. The method of Claim 3, wherein the haploid DNA derived from a single individual is human, bovine, primate, ovine, or porcine.

5. The method of Claim 4, wherein the cell is a human or bovine oocyte and the haploid DNA is human DNA.

6. The method of Claim 1, where said activation conditions include the use of DMAP (phosphorylation inhibitor) or other compound that inhibits second polar body extrusion.

7. The method of Claim 1, wherein activation conditions include use of a compound that inhibits microfilament or protein production.

8. The method of Claim 7, wherein said compound is cycloheximide or cytochalasin B.

9. The method of Claim 1, wherein the haploid DNA is of a female origin.

10. The method of Claim 1, wherein haploid DNA is of male origin.

11. The method of Claim 1, wherein the haploid cells are human oocytes containing human male or female DNA.

12. The method of Claim 1, wherein said cultured cells of (d) are allowed to differentiate.

13. The method of Claim 1, wherein said cells are implanted at a desired site *in vivo* that is to be engrafted with cells or tissue.

14. The method of claim 13 wherein said cells are implanted in an immunocompromised non-human animal.

15. The method of Claim 13, wherein said site is a wound, a joint, muscle, bone, or the central nervous system.

16. The method of Claim 1, wherein the cell obtained by (d) is genetically modified.

17. A method for producing pluripotent (ES) cells that can be used to desired differentiated cell types comprising:

(i) producing a diploid cell by implantation of two haploid nuclei derived from the same male or female individual, which optionally may be genetically modified;

(ii) gynogenetically or androgeneticaly activating said diploid metaphase II cell to produce an embryo having a discernible trophectoderm and inner cell mass; and

(iii) isolating said inner cell mass or cells therefrom and culturing said ICM or cells therefrom in an *in vitro* media that maintains said cells in a pluripotent, undifferentiated state.

18. The method of Claim 17, wherein the diploid cell is a mammalian oocyte or blastomere containing two identical male or female haploid genomes of the same or different species relative to said mammalian oocyte or blastomere.

19. The method of Claim 17, wherein the diploid cell is a mammalian oocyte or blastomere that has been implanted with two identical male or female haploid nuclei.

20. The method of Claim 19, wherein the haploid nuclei are human, primate, porcine, or bovine nuclei and the mammalian oocyte or blastomere is a human or bovine oocyte or blastomere.

21. The method of Claim 19, wherein said male haploid nuclei are that of human sperm.

22. The method of Claim 17, wherein the pluripotent cells obtained in step (iii) are transferred to an *in vitro* culture or *in vivo* site, wherein said pluripotent cells give rise to different differentiated cells or tissues.

23. The method of Claim 22, wherein said pluripotent cells are introduced at an *in vivo* site that is to be engrafted with cells or tissues.

24. The method of Claim 22, wherein said *in vivo* site is bone, cartilage, bone marrow, muscle, a joint, or a wound site.

25. An improved method of cell or tissue therapy wherein the improvement comprises using cells or tissues produced according to Claim 22.

26. Pluripotent cells derived from haploid cells of male or female origin.

27. The pluripotent cells of claim 26 which are primate pluripotent cells.

28. The pluripotent cells of claim 27 which are human pluripotent cells.

29. Differentiated cells derived from the pluripotent cells of Claim 25.

30. The differentiated cells of Claim 29 which are primate.

31. The differentiated cells of Claim 30 which are human.

32. The pluripotent cells of Claim 26 which are genetically modified by insertion, deletion, or substitution of a particular DNA.

33. Pluripotent cells produced by the method of Claim 1.

34. The pluripotent cells of Claim 33 which are primate.

35. The pluripotent cells of claim 34 which are human.

36. A method of identifying growth factors that induce differentiation into specific cell types comprising exposing pluripotent cells to different combinations of growth factors, and selecting growth factor combinations that result in differentiation into specific differentiated cell types.

37. The method of claim 36 wherein said method comprises exposing said cells to both different combinations and concentrations of growth factors.

38. The method of claim 36 which selects for growth factors and culturing conditions that induce the differentiation of said pluripotent cells into differentiated cells selected from the group consisting of neural cells, cardiac cells, bone cells, hematopoietic cells, red blood cells, cartilage, intestinal cells, retinal cells, corneal cells, esophageal cells, and stomach cells.

add a7